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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/928,833	08/14/2001	Fumio Matsui	MATSUI 5	8102

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EXAMINER	
ANGEBRANNDT, MARTIN J	
ART UNIT	**PAPER NUMBER**
1756	

DATE MAILED: 08/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/928,833	MATSUI ET AL.	
	Examiner	Art Unit	
	Martin J. Angebranndt	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-12 and 14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-12 and 14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The response of the applicant has been read and given careful consideration. Responses to the arguments of the applicant are presented after the first rejection to which they are directed. Rejections of the prior art not repeated below are withdrawn based upon the amendments to the claims and the corresponding arguments.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-5,7-12 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims should specify the size of the medium for the claims to be congruent with the arguments. (the current language only specifies a possible capacity)

4. Claims 5 and 12 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

These limitations were folded into the independent claims.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this

> subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1,2,5 and 7 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Oba et al. JP 60-083236.

See example using comparative example dye 2 (page 7, upper left), which is an indolenic trimethine dye which differs from dye of chemical formula 20 (page7) of the instant specification by only it's counterion, which is perchlorate. The use of quenchers, including metal chelates is disclosed. (abstract)

The coverage sought by the applicant for the medium is irrespective of the intended use which the shorter wavelengths. The absorption of dyes is broad and the examiner notes that similar compound 20 is used in example 2 with 450 nm lasers in the instant specification, the examiner therefore holds this to support the inherency in the absorption properties of the dye, ire that it can be used for recording at least one wavelength of less than 450 nm.

(note that Ootaguro et al. '882 teaches . 4-N,N-diethylamino-4'-nitrosodiphenylamine, the nitroso light resistance improver used in example 2, is disclosed as having a maximum absorption at 440 nm) .

In response to the declaration, the examiner points out that the same or similar dyes as used by the applicant in their examples in the instant specification are used in the references applied. These do not have absorption in the far red (780 nm), but have absorption maxima in

the 500-600 nm range. The declaration does not address the novelty or unobviousness of the use of these dyes in optical recording media. As long as the dye absorbs the laser light, it is sensitive enough to record information. The media as claimed do not distinguish over the prior art as the dye controls the sensitivity of the recording medium. The examiner agrees that the use of shorter wavelengths leads to increased data density due to the wavelength dependency of the diffraction focusing limit, but the claims to the media only require the media, not the laser as well. The use of the laser is considered intended use, but the examiner notes that the dyes of the references applied are similar to those exemplified in the specification and used with the 405 nm laser.

The analysis in the declaration of the applicant fails to account for the fact that the dyes have a wide absorption band, which extend on both sides of the absorption maxima. (see Hamer at page 20, cited 2/1/06 as evidence of this for cyanine dyes in particular). It is also clear from the showing of Hamer that dyes with different length methine chains absorb at different wavelengths, but all exhibit this feature (absorption on both sides of the absorption maxima). To assert that just because a different portion of the spectrum is used, this is not the case is flawed. The problem with the use of the argon ion laser is not that there are not dyes which absorb at the required wavelength, but that the size (about 40 inches), the cooling requirements (several gallons of water/minute) and the power (30 amps, 440 volts), rendered it commercially unviable when compared to diode lasers which are about the size of a matchbox, require little or no cooling and require only milliamps of current. These advantages allow diode lasers to be placed in CD players, DVD players and computers and become commercially viable. The applicant's arguments also ignore various formats or recording techniques (such as land and groove recording) and seem to require that the optical medium be used in a particular manner. **The**

applicant may wish to require the media have particular track pitches and/or groove widths to facilitate tracking at these higher densities. There is some basis for this set forth in the prepub of the specification at [0031 and 0034], but it is sparse and a bit confused. With grooves present, the data capacity is limited by the grooves as the data formed in constricted in the radial direction by the grooves (in the groove and/or on the land) and limited in the tangential direction by focusing of the laser. The examples of the instant specification do not describe the pitch of the recording media used and the language used in the description of the pits is the same for both, although the information density of the two media differ significantly (more than 4 vs more than 15 GB). A declaration by the applicant describing what pitch and groove widths are required by the claim language for both groove recording alone and recording on both the groove and land areas and including supporting evidence, such as calculations and/or supporting documentation would be useful. This also would help the applicant address the pan sensitization of Namba et al. '231. The rejections stand.

8. Claims 1,4,5 and 7 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Okamoto et al. JP 09-277703 (machine translation attached).

See example 8 in table 1, which uses the same compound as disclosed as chemical formula 35, used in example 2 of the instant specification with 450 nm light, to form an optical recording medium of the form used in example 1 [0043]. See also the other examples which use dyes 34,36 and 37 of the instant specification in optical recording media of the same form as used in example 1. The use of light improving agents is disclosed. [0026].

9. Claims 1-3,5 and 7 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Shinkai et al. '656.

See example 3 (72/49), which use dye B-3 (33/45), which is similar to dye of chemical formula 26, which is used in example 2 of the instant specification, but has a different counterion (perchlorate). Note also the other examples in this reference, which use trimethine cyanine dyes. The use of light stabilizers is disclosed (38/34-60).

10. Claims 1, 2, 5-9, 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nanba et al. JP 60-204396.

Nanba et al. JP 60-204396 teaches the absorption of dyes D32 (perchlorate) and D36 (bromide) in the table on page 29. The absorption maxima of dye D36 is 880 nm and the reflection maxima is 970 nm. The wavelength used in recording is 830 nm (page29, left column) for the examples disclosed in table 1 on page 30. **Example 3 uses dye D36, which has absorption maxima at wavelengths greater than 830 nm together with dye D32 and metal chelate Q3-12. The chelate is present in an amount of 4 parts to five parts of D36.** The use of dyes which have an absorption maxima within the range 40 nm shorter and 70 nm longer than the writing wavelength is disclosed in the abstract. The use of lasers including HeNe (632.8 nm), Argon ion (488, 514.5 nm), HeCd (442 and 325 nm) is disclosed on page 28 in the lower left hand column. Useful counterions include perchlorate, tetrafluoroborate, aryl sulfonic acids (page 8, right hand column). Linkages disclosed include trimethine and monomethine linkages LVIII and LIX on page 8 of the reference.

For the embodiments within the scope of coverage sought where the dye is a cyanine dyes as set forth in claims 2, it would have been obvious top one skilled in the art to use other

disclosed cyanine dyes, such as those using the trimethine and monomethine linkages LVIII or LIX alone or with counterions from the table on pages 9-14 or page 8 and to use these with appropriate disclosed lasers, such as the HeCd, which have emissions at wavelengths up to 70 nm shorter than the maximum absorption of the dyes with a reasonable expectation of successfully writing data into the recording layer based upon the disclosure of using dyes which have absorption maxima up to 70 nm longer than the emission wavelength of the laser.

The applicant has argued that the use of laser wavelengths which are below the absorption maxima of the dyes is unanticipated or unappreciated in the prior art. This is incorrect as this reference clearly discloses the use of laser wavelengths up to 40 nm less than the absorption maxima of the dye. The examiner recognizes that the absorption profiles of the dyes films have longer tails on the long wavelength side, than on the short wavelength side and it may be more conventional to use longer wavelength laser due to their cost and availability. The move toward shorter wavelengths is clearly motivated by the increased density of information due to the smaller spot size the laser can be focused down to. The reference also teach the use of 442 and 325 nm HeCd laser which meet the newly added limitations of the claims. The arguments do not address the use of trimethine cyanine dyes.

11. Claims 1-5,7-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over **any one of** Nanba et al. JP 60-204396, Oba et al. JP 60-083236, Okamoto et al. JP 09-277703 **or** Shinkai et al. '656, in view of Ootaguro et al. '882 and Namba et al. '231.

Ootaguro et al. '882 teaches in examples 54 and 55, the coating of a solution of 3 parts cyanine dye NK 2421 (a heptamethine cyanine dyes with a perchlorate anion, see Maruyama et al. below) and 1 part 4-N,N-diethylamino-4'-nitrosodiphenylamine (the ethyl homologue of the

compound used in example 1 of the instant specification) (0.33:1 ratio), which is coated on a glass substrate. 4-N,N-diethylamino-4'-nitrosodiphenylamine is disclosed as having a maximum absorption at 440 nm. (24/28). 4-N,N-dimethylamino-4'-nitrosodiphenylamine is also disclosed (6/24-37). These compounds are disclosed as not suffering from the low solubility of other stabilizers, such as metal complexes (2/6-43).

Namba et al. '231 teach the use of mixtures of dyes to cover the entire spectral range. The NK and IR dyes of table III are cyanine dyes with perchlorate counterions. The absorption maxima of the dyes is given in tables I,II and III and the wavelength of useful lasers is disclosed in the table in column 3. These include 325, 442, 488, 514.5 (515), 633 nm.

It would have been obvious to one skilled in the art to modify the compositions of **any one of** Nanba et al. JP 60-204396, Oba et al. JP 60-083236, Okamoto et al. JP 09-277703 **or** Shinkai et al. '656 by adding the light stabilizing 4-N,N-diethylamino-4'-nitrosodiphenylamine of Ootaguro et al. '882 rather than the metal chelate quenchers due to its increased solubility as with the added advantages that as it absorbs in the blue, it would confer additional sensitivity to the optical recording medium in that portion of the spectrum based upon the teachings of Namba et al. '231, which teaches that extending the spectral range of optical recording media is desirable. There is no language describing what range is "around 405 nm" embraces.

What the applicant fails to appreciate is that the use of mixtures of dyes to extend the spectral response of the optical recording media is old and well known to be desirable as evidenced by Namba et al. '231 and that this dovetails nicely with the applicant's use of dye mixtures in the examples.

What might prove to be patentable is the use of optical recording media consisting of dyes, such as those disclosed by the applicant as chemical formulae 20-38, where other absorbers/dyes are not present. This would exclude the nitroso compound used as a quencher as well due to its absorption at 440 nm. (claims 1-5,7 and 14 would have to be cancelled). The limitation of the claims to these dyes combined examples using them alone and data relating to their absorption maxima may serve to obviate the rejections of record for the method claims, in particular if the absorption maxima are evidenced to be more than 40 nm longer than 450 nm. There are not examples using these dyes without other dyes and the dyes of compounds 1-19 would likely not work as they absorb soley at longer wavelengths.

12. Claims 1-5,7-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over **any one of** Nanba et al. JP 60-204396, Oba et al. JP 60-083236, Okamoto et al. JP 09-277703 **or** Shinkai et al. '656, in view of Ootaguro et al. '882 and Namba et al. '231, further in view of Nee '811 combined with Hamer, "The Cyanine Dyes and Related Compounds", pp. 244-269,274-279 and 398-433 (1964), Huditch et al. '584, Saito et al. '089, JP 64-040388, JP 03-009884, JP 10-119434 or JP 03-032884.

Hamer, "The Cyanine Dyes and Related Compounds", pp. 244-269,274-279 and 398-433 (1964) teaches the heptamethine dyes disclosed on pages 244-269 (straight chain) and 274-279 (cyclic containing chain) for claims 15 and 16. These are the same class of dyes shown in formulae 1-20 of the instant specification. See the styryl dyes on pages 398-433 which include those disclosed in formulae 25-33 in the instant specification. See dye VIII on page 252 (comparable to chemical formula 11 of the instant specification) and XIX and text on pages 267-268 (comparable to formula 19 of the instant specification) See also formula XV on page 277.

See dye I on page 398, which is comparable to formula 25 of the instant specification. Perchlorate ions as counterions for cyanine dyes are described on page 253, 262,263 and 267 and the use of toluenesulfonate as a counterion is disclosed on pages 278 and 279. Perchlorate ions as counterions for styryl dyes are described on page 413 and 415 and the use of methylsulfonate is disclosed on pages 412,420 and 427.

Nee '811 teaches GaN lasers operating at about 400 nm used with optical recording media (12/25+)

Huditch et al. '584 in examples 1, 11 and 12 for their cyanine dyes.

Saito et al. '089 in twentieth and twenty first embodiments (cols 22-23). Useful counterions are disclosed in the abstract together with their benefits.

JP 64-040388 in examples 1 (perchlorate), 2 (tetrafluoroborate), 3 (perchlorate and arylsulfonate counterions) and other examples. Note the counter ions disclosed in the abstract. Please note the absorption data including their absorption maxima.

JP 03-009884 discloses dyes 4 and 5 on page 9 with triethylammonium cations.

JP 10-119434 discloses dyes HP9, HP8 (page 35) and HP2-5 (page 34). Useful counterions are disclosed in the abstract.

JP 03-032884 discloses dyes on page 6 with perchlorate counterions. See also examples 2 (page 8 upper right)

To address the various anions recited with respect to formula 2, in addition to the basis provided above, the examiner asserts that it is old and well known in the art that cyanine and styryl dyes are closely related as evidenced by Hamer, "The Cyanine Dyes and Related Compounds", pp. 244-269,274-279 and 398-433 (1964) and the examiner holds that it would

have been obvious to one skilled in the art to modify the combination of **any one of** Nanba et al. JP 60-204396, Oba et al. JP 60-083236, Okamoto et al. JP 09-277703 **or** Shinkai et al. '656, in view of Ootaguro et al. '882 and Namba et al. '231 by using other counterions known to be useful with cyanine dyes such as those disclosed by Huditch et al. '584, Saito et al. '089, JP 64-040388, JP 03-009884, JP 10-119434 or JP 03-032884 with a reasonable expectation of forming a useful cyanine dyes and that the dye would be useful in optical recording and the use of optical recording media sensitized across the entire visible spectrum (400-900 nm) by Namba et al. '231 is considered to direct one to the use of GaN laser which operate at about 400 nm.

The above rejections would be withdrawn if the media were on grooved substrates

13. Claims 1,2,4-5,8,9 and 11-12 are rejected under 35 U.S.C. 102(e) as being fully anticipated by Saito et al. '494.

Comparative examples A and C use compounds embraced by the language of claims 2 and 4. These are coated on substrate, which are 12 cm in diameter, 0.6 mm thick, and having tracking groove with a pitch of 0.6 microns and a groove width of 0.3 microns, overcoated with silver and a protective layer. [0099-0104,0106]. The use of lasers in the 390-415 nm range is disclosed. [0097]. These are used with a 408 nm laser [0112]. The addition of quenchers is disclosed. [0090-0094] The examples using the dyes I-1 through I-3, ,II-1, II-3, II-4, II-8, II-13,II-1, III-3, III-4, III-12, or III-14 which are similar to trimethine cyanine dyes and are held to inherently have absorption maxima at longer wavelengths than 405 nm.

14. Claims 1,2,4-5,7-9,11,12 and 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. '494.

It would have been obvious to one skilled in the art to add quenchers to the inventive examples with a reasonable expectation of gaining the advantages ascribed to these at [0090-0094].

15. Claims 1,5,8, and 12 are rejected under 35 U.S.C. 102(a) as being fully anticipated by Usami JP 2001-307375 (machine translation attached)

See example 1, where a polycarbonate substrate with 0.48 wide grooves is coated with a dye (see absorption in figure 1, where the highest absorption maximum is at 600 nm) and evaluated using a 408 nm laser to form 0.133 micron pits. [0045-0048]

16. Claims 1,2,4-5,8-9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meada et al. JP 11-053758 (machine translation attached), in view of Kashiwagi et al. WO 99/00794 ([US 6,353,592] is an English equivalent, filed under 371)

Meada et al. JP 11-053758 (machine translation attached) teaches the substrate provided with a recording layer and reflective layer in either order and a protective layer. [0007,0020]. The recording layer can be various organic dyes including aza-annulene, polymethine (cyanine, merocyanine, squarilium), anthroquinone, azulenium, metalllied azo dyes and the like. [0011]. The laser can be 370-520 nm, in particular 410 and 417 nm lasers are disclosed. [0023-0024].

Kashiwagi et al. WO 99/00794 teaches topside optical reocrding media with respect to figure 5 where the WORM recording layer is a cyanine or phthalocyanine dye. (22/23-25, [13/42-48]). The pitch should be less than 0.64 microns. (7/18-20; [4/34-37]). The use of laser wavelengths including 0.4 microns (400 nm) is disclosed.(17/10-16, [10/26-33]).

Meada et al. JP 11-053758 teaches the invention as claimed, but does not describe the grooves used. It would have been obvious to modify the examples of Meada et al. JP 11-053758 using azo or trimethine cyanine dyes by using the 410 nm laser disclosed with a reasonable expectation of forming useful data in the medium and using grooves with pitches of less than 0.64 microns disclosed by Kashiwagi et al. WO 99/00794 as useful with laser of 400 microns and with cyanine dyes in particular.

The resolution resulting from the use of near filed optics and the shorter wavelength will exceed the resolution required to record 15 GB of information, due to the shorter wavelength, the larger numerical aperture and the larger effective refractive index which serve to reduce the spot size of the focused laser beam.

17. Claims 1-5,7-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meada et al. JP 11-053758 (machine translation attached), in view of Kashiwagi et al. WO 99/00794 ([US 6,353,592] is an English equivalent, filed under 371), further in view of Shinkai et al. '656.

In addition to the basis above, it would have been obvious to add stabilizers, to the recording layer of the media resulting from the combination of Meada et al. JP 11-053758 and Kashiwagi et al. WO 99/00794 to improve the stability of the resulting recording media and/or to use styryl dyes, such as B-3 in place of the trimethine dyes based upon the disclosure of equivalence by Shinkai et al. '656.

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Takada et al. '735 (WO 00/65584) discusses the capacity of short wavelength and near field with ROM as at least 15 GB and more on the order of 25 GB.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Martin J Angebranndt
Primary Examiner
Art Unit 1756

07/31/2006